

Silicon & Thin-Film Solar Panel Recycling Process Programs

Cost-effective and Eco-Friendly recycling programs

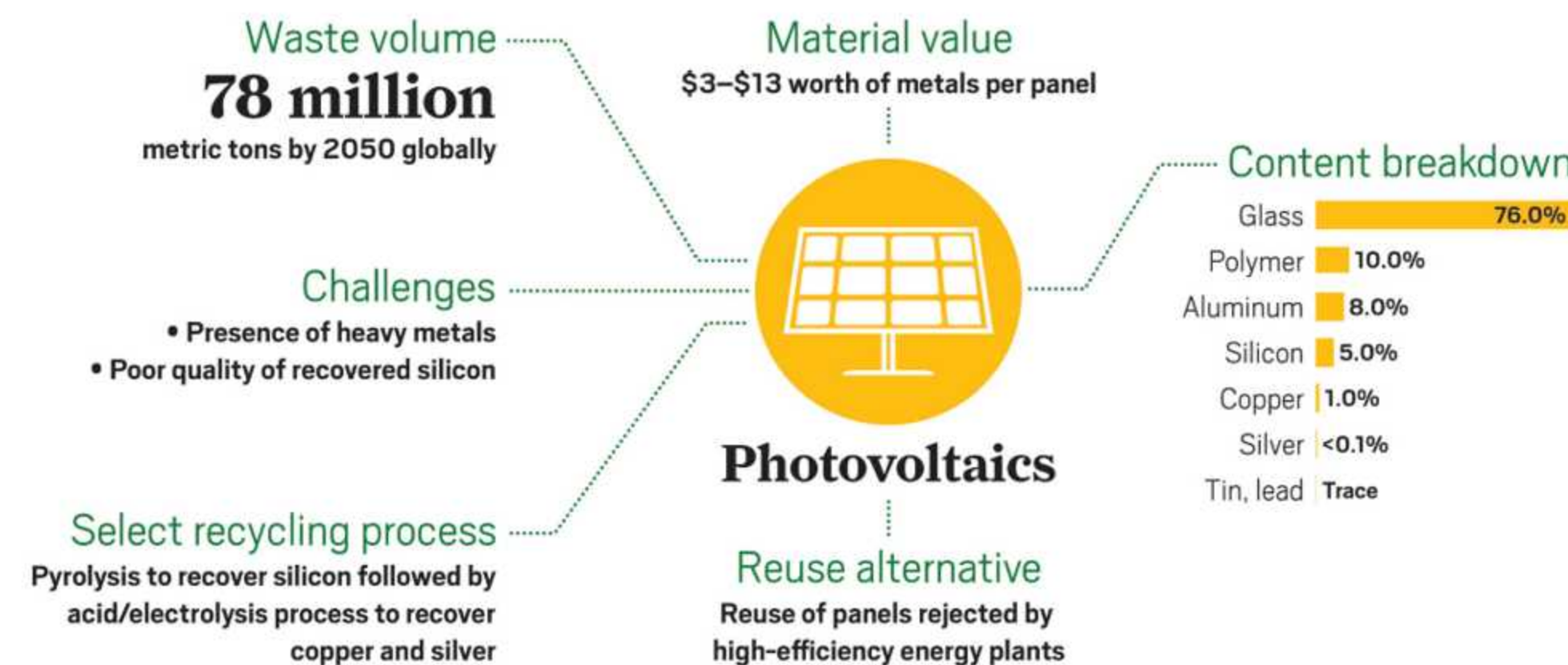
SPWR – Solar Panel Waste Recycling

Problem

- Solar panels are set to reach end-of-life → Landfill or recycled?
- Heavy metals presence in solar panels → waste is managed poorly → another recycling crisis
- EU standard PV recycling → ash, metals Tin, Al, Lead, Zinc → Landfill
- 30,000 metric tons/year → 500,000 metric tons/year of waste PV panels next two decades
- Too little ~\$3 metals worth/panel in current recycling process, not enough to pay for recycling
- Low quality of silicon recycled materials

Our approach SPWR and plan

- More eco-friendly chemical processes very little go to landfill
- +\$12 metals worth/panel to pay for recycling
- Demonstrated high efficiency, throughput and reliable PV SPWR process programs; time to scale!



Ready	▪ Set up evaluation/validation and test team Si SPWR
Set	▪ Manufacturing test run, improvements and efficiency test Si SPWR
Go	▪ Completed Si SPWR and well into Thin-film SPWR commercialization

Impact

- Eco-friendly, cost-effective recycling process programs for both Si and thin-film PV panels.
- With higher \$ metals worth than current recycling program
- No vaporization of heavy metals or go to landfill
- More ultra-pure Nano-structured recycled silicon



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